Testing and evaluation of GSI Hybrid Data Assimilation for basin-scale HWRF

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Numerous studies have found that using a hybrid ensemble-variational (VAR) technique in a data assimilation (DA) system tends to impose positive impacts on weather forecasts by incorporating flow dependent background error information into a traditional VAR system. The Gridpoint Statistical Interpolation (GSI) based hybrid data assimilation system (GSI-hybrid) was primarily developed by NCEP/EMC and NOAA/ESRL and implemented operationally at NCEP for global applications in May 2012. Since then, this GSI-hybrid system has shown remarkable positive impacts on the global forecasts. At the Developmental Testbed Center (DTC), in collaboration with the code developers and researchers sponsored by the NOAA Hurricane Forecast Improvement Project (HFIP), efforts are being made to implement code management for this hybrid DA system as well as to test and evaluate the system for regional applications. This presentation will focus on the ongoing GSI-hybrid system tests for the basin-scale Hurricane Weather Research and Forecasting mode (HWRF) application. The analyses and forecasts generated by the GSI-hybrid system will be compared with those from the traditional GSI VAR system in selected high impact tropical cyclones. This talk will also discuss efforts to investigate alternative configurations of the system and the potential to improve the system performance in a tropical storm environment.